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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/076,227	02/14/2002	Hans-Jurgen Schreiner	CERA 238 (10201695)	8559
24972	7590	10/06/2004	EXAMINER	
FULBRIGHT & JAWORSKI, LLP			ADDISON, KAREN B	
666 FIFTH AVE			ART UNIT	
NEW YORK, NY 10103-3198			PAPER NUMBER	

2834

DATE MAILED: 10/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/076,227

Applicant(s)

SCHREINER, HANS-JURGEN

Examiner

Karen B Addison

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 39-58 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 39-58 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 39-58 rejected under 35 U.S.C. 103(a) being unpatentable over Shuichi (JP06310278) in view of Hirofumi (JP09148640).

Shuichi disclose in figs. 1-6 a Piezoceramic multi-layer actuator (fig.1) with alternating internal electrodes(3a,3b) that have contact surfaces and lead to the surfaces of the actuator (3a, 3b) and inactive regions (9)assigned to them, with the internal 'electrodes of the same polarity being connected by their contact surfaces (Peripheral face) to form a parallel circuit to corresponding external electrode (6,7) in each case, and the external electrode being arranged on opposing sides of the actuator, characterized in that the contact surfaces (17), and therefore the inactive regions (9) assigned to them of one or a predetermined number of internal electrode of the same polarity arranged above one another in the same direction, are arranged offset one another by a predetermined angle of the value α with respect to the contact surfaces, therefore the inactive regions assigned to these, of the preceding internal electrode or a predetermined number of preceding same –polarity internal electrode, of the same alignment. Characterized in that the offset is such a size as a multiple of the predetermined angle, according to the predetermine height (see fig.1), therefore the predetermine layers, consisting of a layer

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that the offset is such a size as a multiple of the predetermined angle, according to the predetermine height (see fig.1), therefore the predetermine layers, consisting of a layer of piezoelectric ceramic material (2) with internal electrodes located thereon, that at least the contact surfaces of the first and last of the internal electrodes of the same polarity in this range, no longer overlap. Shuichi also discloses the piezoelectric ceramic material with internal electrodes so large that the inactive regions (9) of the first and last of the internal electrodes of the same polarity in this region no longer overlap. Wherein, the offset is reversed in the opposite direction in each case after the completion of one region or several regions, so that a wave-shaped run of the offset is produce and the head and foot region having internal electrodes spacing increases from electrode to electrode towards the respective actuator (fig.2). Suichi also discloses, the cross section of the actuator as a square, circular and a rectangle. Wherein, the external electrodes (6,7) have a helical run at the connection of the contact surface of the internal electrodes with the same polarity with a constant running offset of the contact surfaces (see figs. 1-5). Although Shuichi does not disclose the formula $a=(h/d)*\arcsine (L/R)$ he is regarded as reading on the claim formula, though he doesn't explicitly state it, in other word, he shows the claim invention in fig.1 . Therefore, if the formula is applicable to claim invention, it must like wise be applicable to Shuich reference. Shuich does not show the piezo-actuator having a borehole along the longitudinal axis of the actuator and pocket holes provided at the ends.

Hirofumi discloses in figs.1-4 a piezoelectric electric actuator comprising': a

Piezoceramic multi-layer actuator (fig.1) with alternating internal electrodes led to the

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surfaces of the actuator (22,23) and inactive regions assigned to them, with the internal electrodes of the same polarity being connected by their contact surfaces (Peripheral face) to form a parallel circuit to corresponding external electrode (3,4) in each case wherein, a bore hole (B) is disclosed along the longitudinal axis of the actuator and pocket holes provide at the ends(22a,23a) for the purpose of connecting the external electrodes to the actuator. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the actuator of Shuichi with the teaching of Hirofumi actuator having a bore for the purpose of provided a laminated piezoelectric actuator which is uniform in displacement through all the displacement surface of it's piezoelectric ceramic at driving. The method is inherent base on the structural limitations of the claims.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to select a region or a range in which the internal electrodes are offset 1 mm to 1.5mm, since it has been held that where the general condition of a claim are disclose in the prior art, discovering the optimum or workable ranges involves only routine skill in the ad, In re Aller, 105 USPQ233

Referring to claims 35-38, no patentable weight has been given to the method of manufacturing limitations (i. e. co-aligning contact surfaces for internal and external electrodes, sintering the green film of the actuator subsequent to shaping the actuator) since "even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-

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process claim is the same as or obvious from a product of the prior art, the claim is patentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Response to Arguments

Applicant's arguments filed 1/30/04 have been fully considered but they are not persuasive.

In response to the applicants argument that Shuichi does not disclose the formula $\alpha = (h/d) \arcsin(L/R)$ is noted.

3. However, Shuichi invention (fig.1) shows a multiplayer actuator with electrodes between the piezoelectric layers. A close look at the figure shows the connection of the internal electrode to the outer electrode (6,7). Each internal electrode is slightly rotated from the electrode above it, so the outer electrode (6,7) only provides voltage to every other electrode respectively. Notice in between each piezo-ceramic layer that there is an area (9): which is electrode free. That electrode free area is positioned, such that each successive piezo-ceramic layer has a free area that is rotated a precise number of degrees from the layer above it. Given this, and given that the applicant also shows this arrangement, Shuichi is regarded as reading on the claim formula, though he does not explicitly state it. In other words, he shows the claim invention. If the formula is thus applicable to the claim invention, it must likewise be applicable to the Shuichi reference. In response to the applicant's argument that Shuichi does not teach or suggest a plurality of inner electrodes of the same polarity arranged over the other, whose contact surfaces are not offset from one another is noted.

However, Shuichi disclose in fig.1 plurality of internal electrodes (3a,3b) having the same polarazation arrange over the other, whose contact surfaces are no offset from one another. (col.009-0031)

4. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

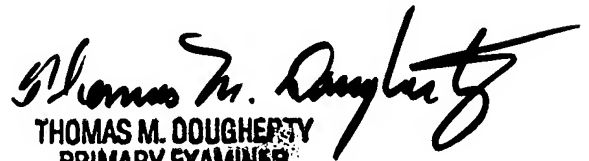
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karen B Addison whose telephone number is 571-272-2017. The examiner can normally be reached on 8:00 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2204. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KBA
9/29/04


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